RESEARCH CENTER
ARIZONA DEPARTMENT OF TRANSPORTATION

JOINT ALASKA – ARIZONA RESEARCH PEER EXCHANGE

Strategic Research Identification and Research Program Oversight

Prepared by:
PEER EXCHANGE TEAM
Clint Adler, P.E., Alaska Department of Transportation and Public Facilities
Roger Healy, P.E., Alaska Department of Transportation and Public Facilities
Barnie Jones, Ph.D., Oregon Department of Transportation
Kelly LaRosa, P.E., Arizona Division, Federal Highway Administration
Sandra Larson, P.E., Iowa Department of Transportation
Cynthia Gerst, Ohio Department of Transportation
Leni Oman, Washington State Department of Transportation
Kris Riesenberg, Alaska Division, Federal Highway Administration
Anne Ellis, Ph.D., Arizona Department of Transportation (Host)

November 2011

Prepared for:
Research Center
Arizona Department of Transportation
206 S. 17th Avenue, Mail Drop 075R
Phoenix, Arizona 85007

ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
ARIZONA DEPARTMENT OF TRANSPORTATION
RESEARCH PROGRAMS PEER EXCHANGE
October 31 - November 2, 2011
Phoenix, Arizona

Introduction

The Arizona Department of Transportation (ADOT) and the Alaska Department of Transportation and Public Facilities (AKDOT&PF) hosted a two-state research management peer exchange October 31 – November 2, 2011 in Phoenix, Arizona. Members of the peer exchange team were:

- Anne Ellis, Ph.D., Director, Research Center, ADOT (Host)
- Clint Adler, Chief, Research Development & Technology Transfer, AKDOT&PF
- Roger Healy, Chief Engineer, AKDOT&PF
- Barnie Jones, Research Program Manager, Oregon DOT
- Kelly LaRosa, Federal Highway Administration (FHWA), Arizona Division
- Sandra Larson, Director, Research & Technology Bureau, Iowa DOT
- Cynthia Gerst, Research Program Manager, Ohio DOT
- Leni Oman, Director, Office of Research & Library Services, Washington State DOT (WSDOT)
- Kris Riesenberg, FHWA, Alaska Division

Contact information is in Appendix A.

Host Arizona DOT Research Center attendees included:

- Sandra Quijada, Administrative Assistant
- Frank Di Bugnara, P.E., Research Project Manager
- Christ Dimitroplos, P.E., Research Project Manager
- Jason Harris, MBA, P.E., Research Project Manager
- Stephanie Huang, P.E., Product Evaluation Program Manager
- Elizabeth Weil, Research Center Intern
- Estomih (Tom) Kombe, Ph.D., P.E., Research Project Manager
- Dianne Kresich, Research Project Manager
- Dale Steele, Research Librarian
- Evelyn Howell, Technical Editor

The 2011 AK-AZ Peer Exchange Team

Walter C. "Butch" Weidlich, FHWA; Sandra Larson, Iowa DOT; Kris Riesenberg, FHWA Alaska Division; Sandra Quijada, Arizona DOT; Barnie Jones, Oregon DOT; Nate Banks, FHWA Arizona Division; Dale Steele, Arizona DOT; Roger Healy, Alaska DOT; Cynthia Gerst, Ohio DOT; Clint Adler, Alaska DOT; Leni Oman, Washington State DOT; Anne Ellis, Arizona DOT; Karla Petty, FHWA Arizona Division; Kelly LaRosa, FHWA Arizona Division.

Theme

"Strategic Research Identification and Research Program Oversight"

Objectives

The objectives of the peer exchange were to explore and identify:

- Effective research advisory council structures
- Strategic research topic/focus areas
- Effective research project selection practices
- Effective strategies to embed research program/activities into DOT culture
- Effective strategies to support DOT priorities within research program
- Effective strategies to position the research program as an effective agent for organizational improvement, growth, and health.

Peer Exchange Team Activities

During the late afternoon of October 31, the team met for a reception for in the Arizona DOT Research Library and met Arizona DOT Research Center staff and the Arizona Division FHWA liaison. Dale Steele (Arizona Research Center Librarian) briefed the team about the resources and staff available at the library.

The team reviewed background documentation describing the organizational structures, research program advisory structures, research project selection processes, and performance management strategies in each of the team member's departments of transportation. (Alaska, Arizona, Iowa, Ohio, Oregon, and Washington State.)

On November 1, the team spent the first half of the day briefing one another with PowerPoint presentations, and dialogue summarizing their respective research programs. Anne Ellis and Clint Adler described in detail their objectives for the peer exchange (listed above).

The team enjoyed brief lunchtime presentations from the Arizona Research Center staff highlighting recent projects from the AZ Research Center research emphasis areas:

- Environment (Tom Kombe)
- Intelligent Transportation Systems (Frank DiBugnara)
- Maintenance (Jason Harris)
- Materials & Construction (Christ Dimitroplos)
- Planning & Administration (Dianne Kresich)
- Structures (Christ Dimitroplos)
- Traffic & Safety (Jason Harris)
- Technical Editing (Dale Steel for Evelyn Howell)

The research team enjoyed a brief questions & answers session with each of the AZ Research Center staff on their presentations.

During the entire afternoon of November 1, the peer exchange team engaged in thoughtful dialog on the differences and similarities in each of the DOT research programs. The team discussed strengths, challenges, and opportunities for improvement in each of the state DOT research programs with special emphasis on Alaska and Arizona. The free-flowing discussion, resembling a "SWOT analysis", focused team members on the various Strengths, Weaknesses (challenges), Opportunities, and Threats inherent in the specific organizational settings and cultures of their DOTs. Each team member noted specific observations and action items for consideration in their respective programs.

The Peer Exchange concluded on Wednesday, November 2 with a summary presentation to ADOT executive staff, AKDOT&PF Chief Engineer, ADOT Research Center staff, and Alaska and Arizona Division FHWA liaisons. During the presentation each DOT research program director summarized their research program, commented on their observations of the "SWOT Analysis", and addressed questions.

See Peer Exchange Agenda, Appendix C

Peer Exchange Team Observations

General Observations

Executive perspective enhances strategic focus: As a peer exchange team member, AKDOT&PF's Chief Engineer provided uniquely valuable executive and leadership perspective to the team's discussions, activities, and "SWOT" analysis. This perspective greatly enhanced the team's discussions and provided the necessary focus on strategic research program management and oversight – the theme of this peer exchange.

Effective Research Advisory Council Structures

Executive and Technical/Expert Advisory Councils:

- An *executive-level research advisory council* can be instrumental in strategic research identification and oversight. The executive advisory council:
  - establishes the strategic direction and objectives for the research program,
  - verifies/validates research project selection,
  - supports and drives research implementation, and
  - reinforces and communicates the value of the research program throughout the agency.
- *Technical/expert research advisory councils* can be responsible for aligning strategic agency vision, goals, and strategies with research.
  - Technical/expert advisory councils have a managerial role in terms of carrying out the strategic direction of the executive advisory council and a leadership role in collaboratively develop and identify specific research needs and implementing research results. They fulfill these roles by:
    - continuously identifying and facilitating collaborative identification of research needs,
    - prioritizing and selecting research projects and initiatives, and

- actively supporting, advising, and facilitating the implementation of research results/products.

- Membership is likely most effective when limited to 7 to 15 individuals.
  - Consider using multiple technical research advisory councils to consolidate strategic interests and/or focus areas with common interests and to ensure representation of all strategic research focus areas.
- In terms of determining who should be on technical/expert research advisory councils:
  - Allow strategic agency vision (outcomes), goals, and strategies to determine whether specific individuals (champions) or positions should serve as council members.
  - Be flexible.
    - Identify influential champions with the passion, time, and trust of others. Such individuals may not necessarily be section/group leaders.
    - Consider term limits and substitutions if necessary to limit negative influences or capitalize on positive attributes of individuals.
- Effective practices to institutionalize technical/expert advisory councils (anchor them in the organizational culture):
  - Explicitly clarify their managerial and leadership roles and performance expectations.
  - Pass on their knowledge.
    - Identify ways for subject matter experts to educate others. (For example, give classes with professional development hours.)
  - Encourage collaboration, such as leading a pooled fund study.
  - Encourage technical/expert research advisory councils to create an organizational business plan for research within each of their technical focus areas. Within these business plans:
    - Identify performance measures.
    - Allow for flexibility and their continuous outreach/marketing.

Strategic Research Topic/Focus Areas

Research focus areas may significantly impact identification of strategic research and program oversight: Some DOTs organize research focus areas (Materials, Planning & Administration, Environmental, etc.) and other DOTs organize their research focus areas based on the Agency's strategic objectives (Mobility, Safety, Economic Vitality, etc.) or outcomes (Project Delivery, Operations, etc.). The extent to which research focus areas are integrated may positively influence the identification of multidisciplinary and/or strategic research needs.

To effectively identify research topic or focus areas:

- Consider outcome-oriented instead of functional focus areas.
- Align focus areas with the DOT's strategic direction.
- Timing is important. Establish focus areas before identification of expert/technical advisory council.

Effective Research Project Selection Practices

Ensure that Technical/Expert advisory councils:

- meet regularly and collaborate broadly, and
- are involved and actively engaged in peer review of research project proposals (for project selection) and products (for implementation).

Be flexible with procedures. Meeting frequency isn't as important as quality. Try to integrate brief research discussions into the agendas of regular meetings (such as statewide meetings of Project Development Engineers or Highway Safety Groups). Regular, useful communication is helpful. A go-to meeting coordination resource is also valuable but meeting logistics can be very difficult – especially as the workforce shrinks.

Effective Strategies to Embed Research Program/Activities into DOT Culture (and Support DOT Priorities)

Organizational culture affects strategic position of research programs: As large, complex organizations, each DOT has a unique culture – which has a profound effect on how staff throughout the organization value and use the research program. DOTs that have a history of valuing continuous improvement and/or innovation tend to more fully engage their research programs in strategic decision-making and integrate research program oversight throughout the organization.

Effective strategies for aligning the research program within the DOT:

- Clarify and continuously communicate the DOT's goals for the research program.
  - Explicitly define success for the research program.
  - Develop and use meaningful performance measures – i.e. those tied to goals established and valued in the agency culture.
  - Ensure that both Executive and Technical/Expert advisory councils are engaged.
  - When available, consider implementing the tool(s) produced by NCHRP project 20-63B "Performance Measurement Tool Box and Reporting System for Research Programs and Projects"
- Do what is necessary to incorporate support for research, organizational health, and continuous improvement activities into agency (overhead) budgeting.

Effective Strategies to Position the Research Program as an Effective Agent for Organizational Improvement, Growth, and Health

- Build on success.
  - Identify challenges early and mitigate them if possible.
- Create early wins.
  - Consider creating an agency award for successful research champions and/or implementation of research.
- Create partnerships unabashedly.
  - Use the Transportation Pooled Fund Program whenever practicable.
    - The lead state does not have to be the contracting state.
- Empower the Technical/Expert advisory council
  - Ensure DOT leadership and/or Executive advisory council effectively communicates the roles and performance expectations of technical/expert advisory council members.
  - Rely on them to identify and prioritize research problem statements.
  - Ensure activities are informal and worthwhile.
  - Ensure necessary resources are available

- Ensure all members are trusted and respected (internal and external to the advisory council.)
- Consider team coaching to maximize sustainability of the council's interests beyond periodic changes in executive leadership.

Planned Actions

Members of the Peer Exchange Team identified actions that they intend to take, either to improve the effectiveness of their own research programs or to assist the efforts of other team members.

Anne Ellis, Arizona DOT Research Center

Challenges	**Actions**
Research topic/emphasis areas may be too specific and restrictive.	1. Restructure and align research topic areas with ADOT organizational goals and strategies. a) Work with research staff to determine meaningful organization of topic areas b) Present plan to executive leadership for approval
Research needs should be determined by internal agenda, not external drivers. Increased ADOT staff engagement necessary to ensure sufficient stock of ideas for robust program.	2. From broad refocusing, an internally responsive research agenda can be built.
Current Research Council is too large, flat, and could benefit from a control mechanism.	3. From (1) and (2) above, restructure and reorganize a two-tiered (executive/steering and technical) research advisory council with well-defined roles. a) Executive/Steering Council is made up of Director's Executive Group members b) Technical Advisory Council is made up of 7-10 senior ADOT managers

Clint Adler, Alaska DOT&PF, Research Development & Technology Transfer Section

Opportunities	Planned Actions
Engage Executive Management Council	1. Host executive research management council meetings • Validate strategic research and training focus areas • Validate research advisory council structure. 2. Identify process and source of funding for RAC activities.
Empower Research Advisory Council (RAC)	1. Clarify roles of sponsors and champions o Managerial o Leadership 2. Communicate process and expectations for effective operation of RAC o Clarify how sponsors and champions 1. Communicate 2. Make decisions 3. Schedule meetings 3. Development template for RAC business plan. o Develop guidance for identifying research and training Goals, Strategies, and performance metrics. o Incorporate communication, outreach, implementation plans into section guidance/ standard operating procedures.
Embed Research Program Activities into DOT&PF Culture	• Customize “Research Makes a Difference” brochure/website for DOT&PF. • Formalize research program performance measures. o Compile supporting data. o Incorporate into NCHRP 20-63B software tool. • Engage executive leadership on overhead (ICAP) budgeting for organizational improvement activities.
Position RD&T2 as effective agent for organizational improvement.	▪ Use Communication Specialist in: o annual reporting o newsletter research articles o research and training product marketing o website development.

Barnie Jones, Oregon Department of Transportation

1. Consider Allocate more funds for flexible, quick response projects within our SPR Work Program, to allow for a rapid response to a major project need.
2. Clarify roles and responsibilities of the Research Advisory Committee, the Research program Manager, and the Transportation Development Administrator, with regard to selecting, vetoing, cancelling, scoping and budgeting for SPR Part 2 projects.
3. Consider outsourcing report editing, as well as the development, maintenance and operation of some information systems, to an Oregon university. Along with that, consider a long term, stable funding agreement to support those services.
4. Use information gleaned in some measure from this peer exchange to frame a discussion with my new Research Advisory committee, to initiate a new strategic plan for research.
5. Consider contracting with universities to provide small stipends for graduate students to finish late reports. Using a student to do this work can be expedient and relatively low cost. If couched in the right manner, it could also serve as an incentive to delinquent investigators to complete work in a more timely manner.
6. Consider expanding Oregon's use of SPR Part 2 funds for purchase of cutting edge laboratory equipment for the purpose of evaluating the applicability of the equipment to their business.

Sandra Larson, Iowa Department of Transportation

- Iowa DOT has a very mature research bureau and will continue to build upon and share its strengths.

Cynthia Gerst, Ohio Department of Transportation

- Focus on the outcomes first, then methodology & resources
- Technical editing takes a lot of effort, make sure it represents us well
    - RAC/CUTC has a task force and report.
- Use videos to pique interest in research
- Problem Statement form - get it from Alaska & Arizona
- UTC partnership if we have only one approved
- Get "Research Notes" from Arizona
- Enhance Marketing
- Share logos with Oregon DOT:
    - color, style, logo - need motto

- Library: allow food & remove newspapers
- Embrace Client Sponsored Research - earmarks, locals, other offices, etc (WA)
- Synthesis of practice (like CTC's) library & another engineer
- Public Service Workshop - pitch to students and $1,250
- Performance measures (AZ) & library (WA)
- Award program dates and information (be able to apply for this recognition)
- Focus Group meetings (IA) paid by State funds
- Rotate the council members to build succession & knowledge

Leni Oman, Washington State Department of Transportation

The agencies represented at this peer exchange demonstrated the diversity of our DOT research programs including: funding levels; program scope (research library, LTAP, new products, etc); organizational compared to agency strategic goals; staffing; and, transitional state. This provided a great opportunity to look at our programs and discuss core program needs and the impact of the agency culture on our programs. Some program activities that I will investigate are listed below.

- Publish the list of experimental features projects and reports on the Intranet so more employees can become familiar with the types of projects conducted (reports are currently available through our searchable research reports). (AZ)
- Revisit technical editing (AZ).
- Investigate opportunity to have no-overhead agreements between Washington universities to promote more collaboration. (IA)
- Investigate option to "buy faculty time" to address technical needs (IA). (In areas other than Traffic, which already has a contract with TRAC).
- Consider developing a "Program at a Glance" document like the one AK has developed that places performance outcomes next to research focus areas.
- Integrate more instruction into Problem Statement form to guide input (AK)
- Reinvest in the Student Studies program (OH)
- Fund NCHRP and TRB Core Services "off the top" of SPR (OR, IA)
- Consider/discuss our role in organizational transformation (OH/AK)

Kelly LaRosa, Arizona Division, Federal Highway Administration

- Continue FHWA division office engagement with AZDOT research program.

Kris Riesenberg, Alaska Division, Federal Highway Administration

- Review Federal Indirect Cost Allocation Program restrictions and field office practices.
- Keep FHWA division office personnel informed and potentially involved in research projects.

Appendix A:
Contact Information for 2011 Alaska DOT&PF and Arizona DOT Research Programs Peer Exchange Team

Arizona

Dr. Anne Ellis, Director
Arizona Department of Transportation Research Center
206 S. 17th Avenue
Mail Drop 075R
Phoenix, AZ 85007
Email: AEllis@azdot.gov
Phone: 602-712-6910

Ms. Kelly LaRosa, Transportation Safety Specialist: RD&T Coordinator
4000 N. Central Avenue, Suite 1500
Phoenix, AZ 85012-3500
Email: Kelly.LaRosa@dot.gov
Phone: 602-382-8991

Alaska

Mr. Clint Adler, P.E., Chief of Research, Development & Technology Transfer
Alaska Department of Transportation & Public Facilities
Research, Development & Technology Transfer
2301 Peger Rd
Fairbanks, AK 99709
Email: clint.adler@alaska.gov
Phone: 907-451-5321

Mr. Roger Healy, P.E., Chief Engineer
Alaska Department of Transportation & Public Facilities
Statewide Design and Engineering Services
3132 Channel Dr.
Juneau, AK 99811-2500
Email: roger.healy@alaska.gov
Phone: 907-465-6958

Mr. Kris Riesenberg, Transportation Planner
P. O. Box 21648
709 West 9th Street, Room 851
Juneau, AK 99802-1648
Email: kris.riesenberg@dot.gov
Phone: 907-586-7413

Ohio

Ms. Cynthia Gerst, Research Program Manager
Statewide Planning & Researach
Ohio Department of Transportation
1980 West Broad Street
Columbus, OH 43223
Email: cynthia.gerst@dot.state.oh.us
Phone: 614-466-1975

Iowa

Ms. Sandra Q. Larson, Director, Research and Technology Bureau
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50021
Email: sandra.larson@dot.iowa.gov
Phone: 515-239-1205

Oregon

Dr. Barnie P. Jones, Research Manager
Oregon Department of Transportation
Research Group
200 Hawthorne SE, Suite B-240
Salem, OR 97310
Email: barnie.p.jones@odot.state.or.us
Phone: 503-986-2845

Washington

Ms. Ellen M. “Leni” Oman, Director
Office of Research and Library Services
Washington State Department of Transportation
310 Maple Park Avenue SE
P.O. Box 47327, Room SC21
Olympia, WA 98504-7372
Email: omanl@wsdot.wa.gov
Phone: 360-705-7974

Appendix B:
List of Acronyms

AASHTO	American Association of State Highway Transportation Officials
ADOT	Arizona Department of Transportation
AKDOT&PF	Alaska Department of Transportation and Public Facilities
BTEP	Boarder Technology Exchange Program
DOT	Department of Transportation
FHWA	Federal Highway Administration
LTAP	Local Technical Assistance Program
NHI	National Highways Institute
PI	Principal Investigators
RDT2	Research, Development, and Technology Transfer
SD&ES	Statewide Design and Engineering Services
SP&R	State Planning & Research
SWOT	Strengths, Weaknesses, Opportunities, & Threats
T2	Technology Transfer
TRB	Transportation Research Board
UA	University of Alaska
UAF	University of Alaska Fairbanks
UTC	University Transportation Center
WSDOT	Washington State Department of Transportation

Appendix C:
Meeting Agenda

ADOT and AKDOT&PF Research Peer Exchange

Monday October 31- Wednesday November 2, 2011

Theme: **Strategic Research Identification and Program Oversight**

Invitees: Sandra Larson, Iowa DOT; Barnie Jones, Oregon DOT; Clint Adler, Alaska DOT; Roger Healy, Alaska DOT; Cynthia Gerst, Ohio DOT; Leni Oman, Washington State DOT; Kelly LaRosa, FHWA Arizona Div.; Kris Riesenberg, FHWA Alaska Div.

Monday, October 31: Arrival and "Administrivia"

Attendees arrive at ADOT; Introductions, receive workshop materials — 4:00 PM

Reception at Research Center with ADOT and FHWA leadership and staff — 4:30 – 5:30 PM

Monday, October 31: Dinner (Location TBD) — 6:00 PM

Tuesday, November1 – Morning: Continental Breakfast — 7:00 AM

Coffee, Bagels, Doughnuts, Fruit

Tuesday, November1 – Morning: Program Review 'Lite'

AZ and AK Research Program Strategic Plans and Performance Measures — 8:00 AM

Project Solicitation and Selection Process — 8:30 AM

Research Council Today (+vision for Research Agenda and new Council structure) — 8:45 AM

Brief discussion

9:00 AM

Tuesday, November1 – Morning: BREAK — 9:15 AM

Tuesday, November1 – Morning: Program Review Lite 9:30 AM - 12:00

Each State Presentation of Research Advisory Council (ca. 30 min. ea)

AKDOT&PF – Clint Adler	9:30 AM
ODOT – Cynthia Gerst	10:00 AM
IDOT – Sandra Larson	10:30 AM
ODOT – Barnie Jones	11:00 AM
WSDOT – Leni Oman	11:30 AM

Tuesday, November1 – Lunch: Sandwiches from the "Old Station" 12:00 Noon

Research Center Staff presentations (ca. 5-7 min ea.)

Tuesday, November1 – Afternoon: SWOT Analysis - ADOT and AKDOT&PF Research Council Case Studies 1:15 – 5:00 PM

Discussion, Working Session, and Action Plan

Tuesday, November1 – Dinner: Location TBD 6:30 PM

Meet at ADOT Research Center

Wednesday, November 2 – Morning: Prepare Presentation for Executive Leadership 7:00 AM

Finish and tighten up presentation

Wednesday, November 2 – Morning: BREAK 9:15 AM

Wednesday, November 2 – Morning: Presentation to Executive Leadership* 9:30 AM

May need to use the Exec Conference Room

Introductions

Presentation

Agenda items “parking lot”

Wednesday, November 2: Adjourn – Lunch if needed

* Invitees: ADOT Executive Group; FHWA Leadership (to include Karla S. Petty; Nathan Banks; Mayela Sosa)